RIPPLE CURRENT TESTER
MODEL 11800/11801/11810

The Chroma 11800/11801/11810 Ripple Current Tester is a precision tester designed for electrolytic capacitors load life testing. It provides constant ripple current output and constant peak voltage (Vpeak = Vdc + Vac_peak) output digital control function. Let load life testing for electrolytic capacitors becomes easier and more reliable. And, the Chroma 11800/11801/11810 use excellent output amplifier design technology to reduce power consumption and internal temperature rising. For long time testing requirement, it can reduce electricity cost and perform high stability. The Chroma 11800/11801/11810 is a just right test solution for electrolytic capacitors quality evaluation.

The precise measurement data and humanization operation is not only to promote reliability of life test but also assure product quality. It is the best choice in measurement.

Four Terminal Contact Test Jig Design
Four terminal contact test jig design, ensure accurate monitoring of voltage dropped on capacitors under test (Patent pending).

Paired Cooper-foil Wiring Test Cable
The Chroma 11800/11801/11810 provides the test fixture for series and parallel, and it improves the loss effectively as high frequency testing causes by the test cable and fixture. The paired cooper-foil wiring test cable reduces voltage drop on the current driving loop and ensures accurate monitoring of ac level dropped on capacitors under test (Patent pending). Working voltage or rated voltage measurement specification too low will be result in the manufacturer's verification invalid problem.

Large LCD Display
The Chroma 11800/11801/11810 uses large 320x240 dot-matrix display, shows more test information at the same time. Combine with guided operation design, makes the tester easier to operation. Users can operate instrument easily with great view of setting functions and test result.
APPLICATION FIELD

CAPACITOR QUALITY EVALUATION
Electrolytic capacitor, tantalum capacitors, and solid-state capacitors users (SMPS maker, PC maker, Electronic devices maker etc.) use to compare the quality between different capacitor vendors.

CAPACITOR QUALITY ASSURANCE
Electrolytic capacitor, tantalum capacitors, and solid-state capacitors manufacture uses to perform quality verification as LOAD LIFE TEST.

TEST METHOD

LOAD LIFE TEST
Electrolytic capacitors load life testing assume the capacitors work at severely adverse circumstance. That circumstance include temperature, current and peak voltage. The temperature is the highest ambient temperature for customer using electrolytic capacitors. The current is the maximal ripple current that the capacitors permit. The peak voltage is capacitor applied voltage, \( V_{dc} + V_{ac\_peak} \). (Figure 1)

Chroma 11800/11801/11810 follows JISC 5141. The standard recommended test circuit as Figure 2 for Electrolytic capacitors load life testing. The circuit contains alternating current voltage source (Vac), isolation transformer (T), alternating current segregate Choke (substitute :diode, L), direct current voltage source (Vdc), DUT capacitors (Cx).

For more test efficient, the users can use series, parallel, or series-parallel connection with one more pair capacitors to save time, but it is based on without any doubtful situation (JIS C 5101-1 1998 4.23.4).

LOAD LIFE TEST JUDGMENT
Electrolytic capacitors load life testing judgment is depend on the change between the electrolytic capacitors load life testing before and after. The judgment includes the electrical specification and surface. The electrical specification contains leakage current, capacitance, dissipation factor, impedance (Z), and equivalent series resistance (ESR) etc.

TEST FIXTURE

1. SERIES
Advantage: Test current are almost equal, lower current capacity required for source.
Disadvantage: Not proper for higher rated WV (>100V) capacitor testing.
Proper for SMPS electrolytic capacitor testing. In General, use Chroma 11801/11810 for testing. (Figure 3)

2. PARALLEL
Advantage: Same applied voltage on capacitors, and is proper for higher voltage capacitor testing.
Disadvantage: Test current is affected by capacitor impedance, contact resistance between capacitor and jig. Larger current capacity required for source.
Proper for low frequency, higher rated WV capacitor testing. In General, use Chroma 11800 for testing. (Figure 4)
KEY FEATURES

**DIGITAL OUTPUT CONTROL FUNCTION**
Chroma 11800/11801/11810 offer digital output control functions to control constant current output and constant peak voltage output. The controller adjust output voltage and current slowly to fit the setup value, during the output near the setup value. To avoid the over ripple current or negative voltage to injure or plus on the capacitors, that is easy to find at using manual control ACV source for output current. It also avoid the over voltage or less voltage by using manual control DC source to output \( V_{dc} + V_{ac\_peak} = V_{peak} \). Over voltage damages the capacitor under test, and less voltage can not satisfy the test specification.

**FEEDBACK SYSTEM**
While load life testing on capacitors, the electrical parameters like impedance (include ESR and reactance) and leakage current may change, which will cause test current change if applied AC voltage is fixed. Chroma 11800/11801/11810 are microprocessor controlled, programmed to keep monitoring output current and feedback to adjust applied AC voltage to make output ripple current in constant, and also to adjust DC bias voltage to make peak-voltage on capacitors under test in constant.

**SERIES / PARALLEL MODE FUNCTION**
Chroma 11800/11801/11810 offer series / parallel mode function. Users can choose the different mode to reach the max benefit. In the series mode, users can get max current output benefit. In the parallel mode, users can get max peak voltage benefit. Sum up the advantages. The series / parallel mode reduces the load life test equipment or the test time by multi DUT in one test equipment to get economic effects.

**MULTI DUT DESIGN**
Chroma 11800/11801/11810 offer multi DUT design. The function offer the key-in DUT amount and series or parallel mode. Chroma 11800/11801/11810/11810 calculate measurement current and peak voltage of the single DUT and show these on the display. Let users easy to organize the measurement detail situation and avoid the human mistake and inconvenience by calculation.

**DIGITAL TIMER INSIDE**
Chroma 11800/11801/11810 offer build-in timer. It use for record the load life test time and control the test time. It could avoid the mistake or inaccuracy by artificiality.

**FOUR TERMINAL CONTACT TEST JIG DESIGN**
Four terminal contact test jig design, ensure accurate monitoring of voltage dropped on capacitors under test

**PAIRED COOPER-FOIL WIRING TEST CABLE**
The Chroma 11800/11801 provides the test fixture for series and parallel, and it improves the loss effectively as high frequency measurement causes by the test cable and fixture. The paired cooper-foil wiring test cable reduces voltage drop on the current driving loop and ensures accurate monitoring of ac level dropped on capacitors under test (Patent pending). Working voltage or rated voltage measurement specification too low will be result in the manufacturer’s verification invalid problem.

**DISCHARGE FUNCTION**
Chroma 11800/11801/11810 offer discharge function. An automatic discharge is always performed after test termination. The automatic discharge function is for ensuring the operational personnel safety.

**BUILD-IN RS485 INTERFACE**
Chroma 11800/11801/11810 has build-in RS485 interface. Users connect with the computer through RS485 to monitor test status.

**ALARM FUNCTION**
Chroma 11800/11801/11810 offer alarm function. Alarm is for indicating of normal or abnormal test termination. Tested time will be recorded if the test is terminated abnormally. An automatic discharge is always performed after test termination.

**LARGE LCD DISPLAY (320 X 240 MATRIXES), FRIENDLY USER INTERFACE**
The Chroma 11800/11801/11810 uses large 320 x 240 dot-matrix display, shows more test information at the same time. Combine with guided operation design, makes the tester easier to operation. Users can operate instrument easily with great view of setting functions and test conditions.
### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>11800</th>
<th>11801</th>
<th>11810</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ripple Current Source</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Output Range</td>
<td>0.01~30A</td>
<td>0.01~10A</td>
<td>0.03~10A, *3</td>
</tr>
<tr>
<td>Frequency</td>
<td>100Hz/120Hz/400Hz/1kHz ± 0.1%</td>
<td>20kHz~100kHz</td>
<td>20kHz~1MHz</td>
</tr>
<tr>
<td>Accuracy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*1</td>
<td>± (0.5% of reading + 0.1% of range)</td>
<td>± (3% + 0.005 A)</td>
<td>± (3% + 0.01 A), *2</td>
</tr>
<tr>
<td>0.030A~0.199A</td>
<td>± (2% + 0.2 A)</td>
<td>± (3% + 0.01 A), *2</td>
<td></td>
</tr>
<tr>
<td>0.20A~1.99A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.0A~10A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0A~30A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ripple Voltage Output Range</td>
<td>90Vrms / 10Arms, 30Vrms / 30Arms</td>
<td></td>
<td>15Vrms maximum</td>
</tr>
</tbody>
</table>

### DC Bias Voltage Source

<table>
<thead>
<tr>
<th>Voltage Output Range</th>
<th>DC 0~500V, ± (0.3% + 0.05V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charge Current</td>
<td>200mA, 40W Maximum</td>
</tr>
</tbody>
</table>

### Signal Monitor Parameter Accuracy

<table>
<thead>
<tr>
<th>Irms (Ripple Current)</th>
<th>0.001A~0.199A</th>
<th>± (0.5% of reading + 0.1% of range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.20A~1.99A</td>
<td>± (2% + 0.005 A)</td>
<td>± (3% + 0.01 A), *2</td>
</tr>
<tr>
<td>2.0A~10A</td>
<td>± (2% + 0.2 A)</td>
<td>± (3% + 0.01 A), *2</td>
</tr>
<tr>
<td>10.0A~30A</td>
<td></td>
<td></td>
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</tbody>
</table>

### Control Function

<table>
<thead>
<tr>
<th>Timer</th>
<th>1 min~10000 hour, 30min error per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
<td>RS-485 (Standard)</td>
</tr>
<tr>
<td>Display</td>
<td>320 x 240 dot-matrix LCD display</td>
</tr>
<tr>
<td>Operation</td>
<td>Start, Stop, Continue</td>
</tr>
<tr>
<td>Protection</td>
<td>OCP, OTP, Over Load</td>
</tr>
</tbody>
</table>

### General

<table>
<thead>
<tr>
<th>Power Consumption</th>
<th>3000 VA max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Requirement</td>
<td>180 ~ 264Vac, 47 ~ 63Hz</td>
</tr>
<tr>
<td>Dimension (H x W x D)</td>
<td>221.5 x 440 x 609.8 mm / 8.72 x 17.32 x 24.01 inch</td>
</tr>
<tr>
<td>Weight</td>
<td>54 kg / 118.94 lbs</td>
</tr>
</tbody>
</table>

Note*1: 23 ± 5°C  
Note*2: Multiple accuracy for test frequency 20~100kHz (x 1), 101~500kHz (x 2.5), 501kHz~1MHz (x 5)  
Note*3: Frequency > 500kHz : 0.10~10.0A only  
Note*4: Frequency > 500kHz : 0.100~10.00A only  

All specifications are subject to change without notice. Please visit our website for the most up to date specifications.

### Ordering Information

- **11800**: Ripple Current Tester 1kHz  
- **11801**: Ripple Current Tester 100kHz  
- **11810**: Ripple Current Tester 1MHz  
- **A118004**: Series Test Fixture  
- **A118005**: Parallel Test Fixture  
- **A118010**: Monitoring Software for Model 11800/11801  
- **A118028**: Monitoring Software for Model 11800/11801  
- **A118029**: SMD Series Test Fixture for Low Voltage  
- **A118030**: PCB for SMD Capacitor  

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